

Brief report

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Clinical features and outcomes of aspiration pneumonia and non-aspiration pneumonia in octogenarians and nonagenarians admitted in a General Internal Medicine Unit

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ABSTRACT

Introduction. Pneumonia is a common infectious disease and causes significant morbidity and mortality especially in elderly people. Aspiration as a cause of pneumonia is common in this population. The aim of our study was to describe the clinical features and outcomes of very old patients with aspiration pneumonia (AP) and comparing them with patients with non-AP.

Material and methods. In this prospective cohort study, we analyzed old patients (≥ 80 years-old) with pneumonia admitted 2014 in the Department of General Internal Medicine.

Results. Seventy-six old patients with pneumonia were included in the study, and 46 (60.5%) met criteria of AP. Increasing levels of urea, creatinine and sodium and low estimated glomerular filtrate rate were more common among AP patients. In addition, severity of pneumonia scored by pneumonia severity index and CURB-65 score were significantly greater in AP than in non-AP patients. The 30-days mortality in AP was (44%) quite higher than in non-AP (32%). The only predictor of mortality was high level of sodium (odds ratio: 1.09; 95% confidence intervals: 1.00-1.18).

Conclusions. AP in octogenarian and nonagenarians showed higher levels of sodium and low estimated glomerular filtrate rate and higher severity of pneumonia and slightly higher mortality than non-AP.

Key words: pneumonia, aspiration pneumonia, octogenarian, nonagenarians, sodium, hyponatremia

Características clínicas y evolución de la neumonía por aspiración en octogenarios y nonagenarios ingresados en una Unidad de Medicina Interna General

RESUMEN

Introducción. La neumonía es una causa de elevada morbilidad y mortalidad en las personas de edad avanzada. La aspiración como una causa de neumonía es común en esta población. El objetivo del estudio fue describir las características clínicas y los resultados de los pacientes muy ancianos con neumonía por aspiración (NA) y su comparación con los pacientes con neumonía no aspirativa (NNA).

Material y métodos. En este estudio de cohorte prospectivo, se analizaron los pacientes ancianos (≥ 80 años de edad) con neumonía ingresados en una Sección de Medicina Interna General.

Resultados. Setenta y seis pacientes ancianos con neumonía fueron incluidos en el estudio, y 46 (60,5%) cumplieron con los criterios de NA. El aumento de los niveles de urea, creatinina y sodio y la menor tasa de filtrado glomerular fueron más comunes entre los pacientes de NA. Además, la gravedad de la neumonía medido por índice de gravedad de la neumonía (PSI) y CURB-65 fueron significativamente mayores en NA que en los pacientes NNA. La mortalidad a los 30 días de las NA (44%) fue superior al de la NNA (32%). El único predictor de mortalidad fue la elevación de sodio (odds ratio: 1,09; intervalo de confianza del 95%: 1,00 a 1,18).

Conclusiones. Octogenarios y nonagenarios con NA presentaron niveles altos de sodio, un menor tasa de filtrado glomerular bajo y una mayor gravedad de la neumonía que la NNA, así como una mortalidad ligeramente superior.

Palabras clave: neumonía, neumonía por aspiración, octogenario, nonagenarios, sodio, hipernatremia

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INTRODUCCIÓN

Pneumonia is a common infectious disease and causes significant morbidity and mortality especially in elderly people. Aspiration as a cause of pneumonia is common in this population, frequently related to neurologic diseases and dysphagia, health problems that increase with ageing¹. Several recent studies reveal that aspiration pneumonia (AP) has a different clinical background, greater disease severity, and poorer prognosis than patients with non-AP²⁻⁵. Hayashi et al.² have reported 100 episodes of AP in patients aged > 15 years old and compared with 114 non-AP. The aim of our study was to describe the clinical features and outcomes of very old patients with AP and comparing them with patients with non-AP.

MATERIAL AND METHODS

In this prospective cohort study, we analyzed old patients (≥ 80 years-old) with community-acquired pneumonia (CAP) and healthcare-associated pneumonia (HCAP) admitted between January 2013 and May 2014 in the Department of Internal Medicine of the Hospital General Universitario Alicante, a 780-bed, an urban teaching hospital serving a large community and referral population in Alicante, Spain. A convenience sample selected was enrolled (all patients were attended by one of the authors, JMR). Patients were followed until death or one month after diagnosis. Diagnosis of pneumonia was established by radiographic evidence of pulmonary infiltration plus acute onset of symptoms of lower respiratory tract infection. Aspiration pneumonia was defined following the criteria of Hayashi et al.² The Institutional Ethics Committee of Hospital General Universitario de Alicante approved the study protocol.

We summarized and compared characteristics of patients at admission, and clinical outcomes between AP and non-AP using the Mann Whitney U-test or chi-square test in accordance with continuous and nominal variables, respectively.

RESULTS

Seventy-six old patients with pneumonia were included in the study, and 46 (60.5%) met criteria of AP. Clinical characteristics of each group (AP / non-AP) are resumed in table 1. Patients with AP were mainly males with dementia and with high dependence level (Barthel index). Increasing levels of urea, creatinine and sodium and low estimated glomerular filtrate rate were more common among AP patients. In addition, severity of pneumonia scored by pneumonia severity index (PSI) and CURB-65 score were significantly greater in AP than in non-AP patients.

The 30-days mortality in AP was 44% (IC 95%: 30.9-58.2%), quite higher than in non-AP 32% (IC 95%: 18.5-49.8) ($p=0.12$). Patients with AP required longer hospital stay (media: 12.1 ± 7.5 vs 8.7 ± 5.6 days; $p=0.04$). Risk factors of mortality associated to pneumonia of any cause in all the studied population are presented in table 2. Mortality was associated with

severe pneumonia (PSI class V and CURB-65 ≥ 3), and higher levels of urea, creatinine, and sodium in the blood. To analyze risk factors of mortality between AP and non-AP patients, we performed a multivariate regression analysis with forced entry methods excluding AP. The only predictor of mortality was high level of sodium (OR: 1.09; 95% CI: 1.00-1.18). Odds ratio of severe pneumonia defined as PSI class V was: 4.06 (CI95%: 0.88-18.5). When, we included AP in the multivariate model, high level of sodium remained as the only factor associated to mortality (OR: 1.10; 95% CI: 1.04-1.19).

DISCUSSION

This study shows that AP have different outcomes, prognosis and mortality rates than non-AP in octogenarians and nonagenarians patients with pneumonia who required hospital admission. Mortality of AP was higher than non-AP but not significantly, probably because the sample size studies was small. The mortality of pneumonia was associated with higher level of sodium in the blood in these patients and after including AP in the equation, the levels of sodium showed a higher association to mortality. Sodium is important factor associated with the mortality in elderly by itself as has seen in this study⁶.

In conclusion, AP in octogenarian and nonagenarians patients has different outcomes than non-AP with slightly higher mortality. Sodium serum levels superior to normal values are associated to mortality in this subset of patients, so this fact has to be in account in the treatment of these patients.

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Variables	Aspiration pneumonia	Non-aspiration pneumonia	P-value
No. of patients	45 (59.2)	31 (40.8)	
Sex, male	28 (71.8)	11 (28.2)	0.021
Octogenarians	38 (62.3)	23 (37.7)	0.272
Nonagenarians	7 (46.7)	8 (53.3)	0.272
CAP	35 (55.6)	28 (44.4)	0.151
HCAP	10 (76.9)	3 (23.1)	
Comorbidity			
Dementia	33 (100)	0 (0)	< 0.001
COPD	13 (28.9)	5 (15.2)	0.152
Congestive heart failure	29 (60.4)	19 (39.6)	0.020
Chronic kidney disease	22 (75.9)	7 (24.1)	0.020
Diabetes mellitus	16 (53.3)	14 (46.7)	0.413
Charlson comorbidity index, mean \pm SD	6.7 \pm 3.2	5.8 \pm 3.1	0.221
Charlson comorbidity index			0.950
0-2	6 (60)	4 (40)	
\geq 3	39 (59.1)	27 (40.9)	
Barthel index, mean \pm SD	14 \pm 23	59 \pm 32	<0.001
Barthel index			<0.001
0-20 points (severe dependence)	40 (74.1)	14 (25.9)	
>20 points	2 (14.3)	12 (85.7)	
PSI score, mean \pm SD	150 \pm 31	133 \pm 33	0.035
PSI classification			<0.02
Class III-IV	15 (44.1)	19 (55.9)	
Class V	30 (71.4)	12 (28.6)	
CURB-65 score, mean \pm SD	3.2 \pm 0.7	2.4 \pm 0.8	<0.001
CURB-65 score			< 0.001
1-2	8 (28.6)	20 (71.4)	
\geq 3 (Severe pneumonia)	37 (77.1)	11 (22.9)	
White blood cell/ml, mean \pm SD	15,132 \pm 7,169	13,888 \pm 6,525	0.451
Urea, mg/dl, mean \pm SD	97.8 \pm 51.2	66.4 \pm 48.	0.002
Creatinine, mg/dl, mean \pm SD	1.72 \pm 0.91	1.33 \pm 0.89	0.050
Glomerular filtration rate, mL/min/1.73 m ² , mean \pm SD	48.0 \pm 28.2	63.1 \pm 35.6	0.022
Sodium, mEq/l, mean \pm SD	142.2 \pm 10.1	135.7 \pm 5.64	0.001
C-reactive protein, mg/dl, mean \pm SD	17 \pm 12.1	16.3 \pm 12.4	0.813

CAP: community-acquired pneumonia, HCAP: healthcare-associated pneumonia, PSI: pneumonia severity index, SD: standard deviation. Data are presented as no. (%) unless specified.

	Non-survivors (n=30)	Survivors (n=46)	P-value	Non-Including aspiration pneumonia		Including aspiration pneumonia	
				OR (95% CI)	P-value	OR (95% CI)	P-value
PSI class V	25 (83.3)	17 (37)	<0.001	4.06 (0.88 – 18.5)	0.071	3.67 (0.69-19.33)	0.122
CURB-65, ≥ 3 (Severe pneumonia)	27 (90)	21 (45.7)	<0.001	2.41 (0.45 – 12.7)	0.301	2.73 (0.54-25.8)	0.181
Urea, mg/dl, mean \pm SD	109.6 \pm 59.5	65.9 \pm 32.2	0.001	1.00 (0.98-1.30)	0.361	1.01 (0.99-1.03)	0.271
Creatinine, mg/dl, mean \pm SD	1.87 \pm 1.04	1.34 \pm 0.75	0.007	1.03 (0.734-3.08)	0.961	0.98 (0.32-2.98)	0.971
Sodium, mEq/l, mean \pm SD	144.4 \pm 10.8	136 \pm 6.0	0.002	1.09 (1.00-1.18)	0.035	1.10 (1.04-1.19)	0.023
Aspiration pneumonia	20 (66.7)	25 (54.3)	0.281	-	.	3.43 (0.79-14.70)	0.092

PSI: pneumonia severity index, SD: standard deviation; OR: Odds Ratio; 95% of CI: 95% of confidence intervals
Data are presented as no. (%) unless specified.